



Rocky Mountain
Remediation Services, L L C
protecting the environment

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000103311

April 7, 1999

Karan S North, Division Manager
Environmental Systems and Stewardship
Kaiser-Hill Company, L L C
Building T130C

CLOSURE DESCRIPTION DOCUMENT FOR TANK AND ANCILLARY EQUIPMENT SYSTEM #13 IN BUILDING 771 - TAH-022-99

Rocky Mountain Remediation Services (RMRS) plan to begin closure of Tank and Ancillary Equipment System #13 in Building 771 in May, 1999. This system will be closed in accordance with the RCRA Closure Plan for Interim Status Units (July, 1998) (Closure Plan). A 45-day notification was issued to the Colorado Department of Public Health and Environment (CDPHE), in accordance with the Closure Plan and with 6 CCR 1007-3, Section 265.111.

Pursuant to the Closure Plan, a Closure Description Document is enclosed for submittal to CDPHE. The Closure Description Document contains a description of the system to be closed, the rationale for the selected method of closure, the types of contamination to be addressed and the schedule for closure activities.

Please transmit this Closure Description Document to CDPHE at your earliest convenience. A draft letter to CDPHE is enclosed for your use.

If you have questions, please contact me at 303-966-7652 or Tom Baker at 303-966-4329.

Ted A. Hopkins

Ted A Hopkins, Manager
Environmental Compliance

TCB dlu

Enclosures (2)
As Stated



RECORDS CENTER

B771-A-000164

CORRES CONTROL		
LTR NO		
K-H Corres #		
99-RF-		
Originator Ltr Log #		
TAH-022-99		
DIST	LTR	ENC
BODEY E D		
CARMEAN C.H		
CRAWFORD A C		
FINLEY M E		
FITZ R C		
GUINN L A		
HUGHES F P		
KASEN J A		
KORENKO M K		
LAW J E		
MILLS S H		
OVERUD T W		
PATTERSON J W		
SUTTON S R		
TRICE K D		
WHEELER M		
WOLF K Z	X	
WOLF H C	X	
ARNOLD P S	X	X
BAKER T C	X	X
BURKS D	X	X
CATHEL R L	X	
HOPKINS T A	X	
LANGLOIS L A	X	X
MARTINEZ G L	X	
URBAN D L	X	
ADMIN RECORD		
	X	X
RMRS RECORDS		
	X	X
TRAFFIC		
PATS/T130G		
CLASSIFICATION		
UCNI		
UNCLASSIFIED	X	X
CONFIDENTIAL		
SECRET		
AUTHORIZED CLASSIFIER		
SIGNATURE		
<i>Ted A. Hopkins</i>		
Date 4/8/99		
IN REPLY TO RF CC NO		
ACTION ITEM STATUS		
q PARTIAL/OPEN		
q CLOSED		
LTR APPROVALS		
ORIG & TYPIST INITIALS		
TCB dlu		
RF-46469 (Rev 1/99)		

1/20

DRAFT

DRAFT

DRAFT

99-RF-XXXXX
DOE # xxxxx

Mr Joe Scheiffelin, Unit Leader
Colorado Department of Public Health and the Environment
4300 Cherry Creek Drive South
Denver, Colorado 80246-1530

CLOSURE DESCRIPTION DOCUMENT FOR TANK AND ANCILLARY EQUIPMENT
SYSTEM #13 IN BUILDING 771 - KSN-XXX-99

Dear Mr Scheiffelin

Pursuant to the *RCRA Closure Plan for Interim Status Units* (April, 1998) (Closure Plan), Kaiser-Hill Company, L L C and the United States Department of Energy, Rocky Flats Field Office (DOE, RFFO) are submitting a Closure Description Document for the closure of Tank and Ancillary Equipment System #13 in Building 771, which will begin in May, 1999

The Closure Description Document contains a description of the systems to be closed, the rationale for the selected method of closure, the types of contamination to be addressed and the schedule for closure activities We request approval of the Closure Description Document within 30 days of receipt, in accordance with the Closure Plan

If you have any questions, please contact Tom Baker of Rocky Mountain Remediation Services at 303-966-4329 or David Grosek of DOE, RFFO at 303-966-3305

Karan S North, Division Manager Date
Environmental Systems and Stewardship
Kaiser-Hill Company, L L C

Joseph A Legare, Asst Manager Date
For Environment and Infrastructure
U S Department of Energy

cc
C Gilbreath - CDPHE
D Grosek - DOE, RFFO
T C Baker - Kaiser-Hill
T Hopkins - RMRS
R M Leitner - Savant Enterprises
C M Madore - Savant Enterprises
N C T Van Tyne - ICF Kaiser

Closure Description Document for

RCRA Closure of Tank and Ancillary Equipment System

#13 in Building 771

U.S. Department of Energy
Rocky Flats Environmental Technology Site
EPA ID No. CO7890010526

Reviewed and Approved by:

Bob Cathel for;
T C Baker, Environmental Compliance, RMRS

4/9/99
Date

Prepared by:

Natalie C Van Tyne
N C T Van Tyne, Project Manager II, ICF Kaiser

4/7/99
Date

REVIEWED FOR CLASSIFICATION/UCNI

By JA Neheim

Date 04-08-99 (U/N)

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1.0 INTRODUCTION

1.1 Purpose and Scope

The Rocky Flats Environmental Technology Site's (RFETS) RCRA Closure Plan for Interim Status Units (Closure Plan) includes the Mixed Residue tank systems and the Idle Equipment tanks in Building 771. Decommissioning and removal of tanks and their ancillary piping and other equipment are subject to the Closure Plan and a subsequent Closure Description Document, which contains a description of the method of closure to be used. A two-step strategy will be employed: (1) wherever possible, meet the requirements for the "RCRA Stable" condition while the tanks remain in place, and (2) remove the tanks from the building at a later date.

The process piping in Building 771 has been divided into thirty-eight discrete "piping systems," with tanks and other ancillary equipment included. Thirty-five of these systems contain process piping connected to RCRA-regulated tanks. In order to prepare for building deactivation and to facilitate closure activities, each tank will be isolated by removing the process piping connected to it. Some tanks are connected to more than one process piping system. Once a tank has been isolated from all process piping systems to which it has been connected, it will be reported in the closure documentation as "RCRA Stable" if the requirements for the "RCRA Stable" condition, as described in the Closure Plan, have been met.

This Closure Description Document applies to Tank and Ancillary Equipment System #13 in Building 771, also known as Tap and Drain Solution System #13. It applies to the closure of tanks D-971 and D-972, which are associated with this system, although these tanks will not become physically isolated during Phase I activities for System #13 or eligible for "RCRA Stable" status. Closure of the tanks will be accomplished in two separate phases:

- a Phase I: Removal of ancillary process piping connected to these tanks, thereby physically isolating each tank and its associated ancillary equipment. To meet the "RCRA Stable" condition, the tanks must be isolated as well as empty. Tanks D-971 and D-972 will be physically isolated during the Phase I activities for Tank and Ancillary Equipment System #11.
- b Phase II: Completion of RCRA closure of the tanks by removal of each isolated, "RCRA Stable" tank, along with any remaining ancillary piping or isolated ancillary equipment.

1.2 Unit Closure Notification and Schedule

The Colorado Department of Public Health and Environment (CDPHE), Hazardous Materials and Waste Management Division, will be notified at least 45 days prior to the start of Phase I or Phase II closure activities. The identified closure activities will be conducted immediately after the 45-day notification period, and are expected to be completed within 180 days. If closure activities cannot be completed within 180 days, a request for extension will be submitted to the Division at least 30 days prior to the end of the 180 days.

Phase I activities for all systems are expected to be scheduled during the August 24, 1998 to December 30, 2001 time period. Phase II activities will be scheduled through the Rocky Flats Cleanup Agreement (RFCA) annual budget planning and Integrated Sitewide Baseline (ISB) process.

Within 30 days after completion of Phase I or Phase II closure activities, a report will be submitted to CDPHE briefly summarizing the closure activities conducted in accordance with this Closure Description Document. The Phase I summary report shall contain the following:

- a declaration that the piping described in the submitted drawings has been removed as planned,
- descriptions of any significant deviations from this Closure Description Document,
- a copy of any newly-generated drawings,
- a statement as to whether the tanks involved have met the requirements of the "RCRA Stable" condition, and
- a summary of relevant analytical results

The summary report for Phase II activities shall contain the following:

- details about the removal of "RCRA Stable" tanks from Building 771, and
- for mixed residue tanks with RCRA unit numbers, a statement that the unit is now clean closed

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1.3 Facility Contacts

The contacts for closure activities at RFETS are

Assistant Manager
For Environment and Infrastructure
Rocky Flats Field Office
U S Department of Energy
P O Box 928
Golden, CO 80402-0928
(303) 966-4298

Division Manager
Environmental Systems
and Stewardship
Kaiser-Hill Company, L L C
P O Box 464
Golden, CO 80402-0464
(303) 966-9876

2.0 BUILDING 771 FACILITY DESCRIPTION

Building 771 is a two-story, reinforced concrete structure, which is partially buried in a hillside located in the north central portion of the site. Since completion of the original building in 1953, several additions have been constructed, including offices, a cafeteria, maintenance shop, loading dock, and the Annex for drum storage.

Operations commenced in Building 771 in 1953. Five major types of production-related activities were conducted: Plutonium Recovery, Plutonium Special Recovery, Aqueous Recovery Technology, Plutonium Metallurgy Research and the Analytical Laboratory. These operations dealt with the recovery of plutonium from "residue" materials which were generated during fabrication, assembly and research operations in the Site's six production buildings, as well as with development of methods for recovery, purification and further processing of plutonium. The Analytical Laboratory provided analytical support to Building 771 and other site operations.

All operations, except for routine surveillances, maintenance and waste management were curtailed in 1989. At the present time, the current mission of Building 771 consists of two major activities:

- a Storage of nuclear and hazardous materials in preparation for onsite consolidation and/or offsite shipment
- b Stabilization of plutonium solutions and other deactivation activities in preparation for decontamination and decommissioning (D&D)

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The waste storage areas and tank units are used to store special nuclear materials, radioactive and mixed wastes, and residues, all of which were generated in Building 771 and in other buildings on the site

3.0 METHOD OF CLOSURE AND PERFORMANCE STANDARD

The tank system described herein will be closed by the method described as "Unit Removal" in the Closure Plan for Interim Status Units, Section E, while incorporating the intermediate stage of "RCRA Stable," as described in Section F of the Closure Plan. All liquids will be drained from this tank system, to the extent practicable, prior to the start of closure activities.

The Phase I performance standard for "RCRA Stable" shall be as follows:

- a The tanks are empty, i.e., they have been drained to the maximum extent possible using readily available means
- b The piping sections shown in Figure 1 have been removed
- c Inlets to and outlets from the tank, except for the vacuum/vent line, have been isolated and contained, or locked and tagged out

The Phase II performance standard is removal of the "RCRA Stable" tanks and any remaining ancillary equipment from Building 771.

4.0 UNIT DESCRIPTION AND WASTE CHARACTERIZATION

The piping for System #13 is located in Room 149, except for one transfer line with a branch in Room 114, which will not be removed as part of Phase I activities for System #13. For this reason, the piping to be removed is shorter in length and less complex in design than in prior systems. The piping is constructed from stainless steel. System #13 was part of the low level dissolution stage of the recovery processes and carried plutonium nitrate and nitric acid solutions. The resulting plutonium nitrate solution was then transferred to other unit operations for further processing. Therefore, moderately high levels of radioactive contamination are currently expected inside the piping.

A narrative description of this system is given in the "System Descriptions and Boundaries" sheet (Attachment 1), Section K, and a description of piping removal scope is given in Section L. An equipment drawing is attached as Figure 1. The total length of piping to be removed during Phase I is estimated to be between 140 and 150 feet, along with the removal of four valves. The valves contain steel housings and stainless steel interiors. Seven termination points (TPs) are shown

in Figure 1, and are labeled consecutively. Containment at the TPs will be designed and implemented to protect the room environment from release of contaminants remaining in disconnected systems. Any significant changes to Figure 1 will be submitted to CDPHE with the Phase I summary report.

During Phase I closure activities, the fill and transfer lines indicated in Figure 1 will be disconnected and removed from the tanks. The vacuum/vent lines will be left in place during Phase I activities, with the valves in the vent position. At the completion of Phase I closure activities for System #13, tanks T-971 and T-972 will not be isolated, but will be isolated during Phase I activities for System #11, at which time they will meet the requirements of the "RCRA Stable" condition and this condition will be documented in accordance with the Closure Plan.

Tanks D-971 and D-972 are listed in the Mixed Residue Tank Inventory as RCRA Unit 93 114 and Unit 93 115, respectively. EPA waste codes D002 (corrosivity) and D008 are assigned to the liquids and removable sludges present in this system based on process knowledge.

This system contained radioactive liquid, therefore, internal radioactive contamination is anticipated. Prevention of release and minimization of work exposure will be addressed in the preparation of the Integrated Work Control Program (IWCP) work package, as described below.

5.0 SPECIFIC CLOSURE ACTIVITIES

Activities will be designed to achieve the closure performance standard, protect human health and the environment, and minimize waste. Specific work instructions, with engineering, health and safety, and waste management information, will be developed prior to the start of identified Phase I or Phase II closure activities. These instructions will be developed in accordance with applicable RFETS policies and procedures.

Closure activities are summarized as follows:

5.1 Establishment of Tank System Boundaries and Scope of Removal for Phase I

The boundaries for System #13, as described in Attachment 1, define the extent of closure activities for this closure description document. The boundaries are at or near flanged joints, which may be sealed with blind flanges. At TPs where release of contamination and worker exposure are of concern, a relatively short pipe stub (length is dependent on field

conditions) which is external to the joint will be used. This type of TP will be sealed and therefore contained by two layers of plastic sleeving taped to the stub.

During Phase I closure activities, all overhead piping between the joints nearest the tank outlets in Room 149 and those nearest the points of entry into the gloveboxes or other tanks, as indicated in Figure 1, will be removed, and the remaining piping capped as described above. The tanks themselves and all remaining ancillary piping and equipment (e.g., pumps, heat exchangers, actuators) are expected to be removed during Phase II closure activities. The removal of tanks T-971 and T-972 is currently scheduled for the July, 2002 time frame.

System #13 piping located inside gloveboxes will be removed when the glovebox is disassembled, to minimize worker exposure and cost. At that time, the waste will be characterized and managed accordingly.

5.2 Preparation of Engineering and IWCP Work Packages (Phases I and II)

A unit-specific IWCP/engineering design package will be prepared for System #13. The RFETS Health and Safety Practices Manual defines the general health and safety measures to be followed at the Site. Closure activities will be conducted in accordance with this manual, incorporating the results of job-specific industrial and nuclear safety-related evaluations and screens.

The IWCP/engineering work package will be used to control work, including preparation of equipment, specification of personal protective equipment, methods of pipe removal and size reduction, methods for containing liquids and preventing releases to the environment, and waste packaging.

As Low As Reasonably Achievable (ALARA) principles will be followed regarding personnel exposures to radiation. Radiological containment will be provided during pipe cutting activities by the use of soft-sided structures such as glovebags, sleeves and/or portable housing. Larger containments may be constructed for dismantlement and size reduction of tanks and associated equipment. Following size reduction, equipment pieces will be inspected and placed into a waste container attached to the bottom of the containment.

The air pressure inside containment will be maintained negative to the room air through the use of a portable air mover or by connection to the building exhaust system. Each process room is maintained at negative pressure relative to the surrounding building or outside atmosphere by the building room exhaust system, which prevents the escape of radiological or hazardous substances to the environment. The exhaust from the air mover will pass through a filter, if necessary, to trap particulates.

5.3 General Methodology for Piping Removal during Phase I

Prior to starting Phase I pipe removal activities, System #13 will be drained by tapping into low points and applying vacuum at each point until no additional liquid can be removed. The system should then be free of liquids. However, it is possible that residual liquids may be encountered during piping removal. The removal method employed will include provisions to contain residual liquids and/or sludges, which may contain high levels of radioactive contamination. Any resulting liquids or sludges will be characterized and treated for final disposal per waste acceptance criteria.

If a blockage is encountered that cannot be cleared readily during the tap and drain process, additional taps will be installed to minimize the length of the blocked section. Blocked sections will be removed with provisions to contain trapped liquids that may be present. These sections will be size reduced in a manner that accommodates the possibility that trapped liquids may be released to containment. A drainage path will be established through any remaining blockages to ensure that all liquid can be drained from the pipe. If significant blockages are encountered during tap and drain activities, piping removal may be conducted in conjunction with those activities.

Piping removal, size reduction and packaging activities are considered to be dynamic processes, in which improvements in technology will be implemented as a result of newly available methods or lessons learned from prior piping removal operations. The piping removal steps described below may be modified in response to actual operating conditions. Possible modifications include the manner in which the pipe sections are separated, the type of containment used as a pipe section is removed, and the type of containment used for size reduction (e.g., a hardwall glovebox, a portable glovebox, a containment house, or a downdraft table with a hood).

In the majority of cases, piping will be removed in the following manner

- a A glovebag or plastic sleeving will be installed around the section of piping to be removed
- b Vacuum will be applied at one or both ends of a pipe section, and removal will proceed toward the vacuum source(s)
- c At TPs, flanges will be disconnected within the glovebag and a blind flange will be applied to the end of the remaining pipeline or the remaining pipe stub will be contained by two layers of plastic
- d The piping will be cut using a four-wheel cutter or a Sawz-All™
- e After the pipe section ends are separated from the rest of the pipeline, the ends of the glovebag/sleeving will be twisted into a "pigtail" formation, from which the ends of the bag can be cut and taped. The pipe section can now be removed with taped plastic containment at both ends
- f If any residual liquid or sludge is observed at either end of the removed pipe section, that section will be immediately bagged into the size reduction containment, to be size reduced and inspected. The recovered residual liquid and/or sludge will be collected, then stored in an approved RCRA storage area
- g If no residual liquid or sludge is observed at either end of the pipe section, it will be brought to the size reduction area at an appropriate time
- h Piping sections will be size reduced, as necessary, using an approved cutting method
- i Pipe sections will be allowed to drain, in a vertical position, as required
- j Pipe section ends will be inspected visually to determine whether a blockage is present within the section
- k Blockages in pipe sections will be penetrated by mechanical means to drain any trapped liquid
- l Pipe sections will be drained of any remaining liquids or sludges, then placed into waste containers. Residual materials will be sampled and immobilized

The contents and condition of the interior of the pipe section will dictate its disposition as waste. Three typical cases may be encountered:

- The interior surface is dry and contains no visible sign of hazardous waste holdup, so that the pipe section can be disposed as non-hazardous waste. This case is expected for all pipe sections in System #13
- The pipe section contains solid residual material adhering to the interior walls, which cannot be removed readily. The pipe

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section will be managed as hazardous or non-hazardous waste, based on analytical results for a representative sample of the material

- A removable blockage or mobile sludge is found, and is removed from the pipe section and sampled EPA codes are assigned to the sludge based on process knowledge or analytical results, and the sludge is treated to meet applicable waste acceptance criteria The pipe section will be disposed as hazardous or non-hazardous waste, after a hazardous waste determination has been made

Each IWCP work package, which will be prepared prior to the start of closure activities, will include more specific and detailed instructions for the sequence of piping removal steps, removal and size reduction methodology, and removal of residual materials from pipe sections

6.0 SAMPLING AND ANALYSIS

Sampling and analytical methods, and quality assurance standards, are addressed in this section

6.1 Sampling Methods

Methods used to collect samples are authorized in 6 CCR 1007-3, Part 261, Appendix I, and the Liquid Residue Treatment Waste Characterization Plan for Process Piping Removal Specific methods will be selected on the basis of ease with which representative samples can be collected, sampling location, sampling matrix, sample container type and size, and accessibility, as well as to maximize the value of data and minimize the number of samples needed

Sampling of liquids is performed using the procedure entitled, Solution Bottle Handling Building 771, PRO-D02-CO-1131. The solution is mixed while in a bottle to assure homogeneity prior to sampling Solid material sampling is performed using the procedure entitled, Laboratory Sampling Procedure, CAS-SOP-003

6.2 Analytical Methods and Location

Analytical work will be performed in an RFETS approved laboratory The analytical test methods for waste characterization are consistent with the approved methods in the Site RCRA Part B Permit, Part VI, Waste

Analysis Plan

6.3 Quality Assurance

The applicable RFETS Field Operating Procedure, 5-21-000-OPS-FO, or equivalent procedure(s), will be used to ensure the integrity of representative samples and analytical data

7.0 DISPOSITION OF CLOSURE-RELATED WASTES

Metal, combustible and liquid/sludge wastes may be generated during either Phase I or Phase II closure activities. It is assumed that the Site waste management and treatment systems will be available to receive wastes generated by these closure activities.

Tank system components and pieces which are radioactively contaminated will be managed in accordance with the requirements of the RFETS Radiological Control Manual and Health and Safety Practices Manual, and will be packaged for disposal in accordance with applicable waste acceptance criteria. All metal waste from this system is expected to be either low level waste (LLW) or transuranic waste (TRU), depending on the amount of actinide present, and will be characterized in accordance with applicable regulations. Tank system components and pieces completely free of any holdup will be managed as non-hazardous waste because there were no listed wastes in this system, and their materials of construction do not exhibit any characteristics of a hazardous waste. If the metal waste is determined to be hazardous debris, then an approved extraction technology may be implemented, however, hazardous debris is not expected for System #13.

Wipes and other combustible materials that are used to clean surfaces or to immobilize free liquids will be placed into waste drums, characterized and managed in accordance with applicable regulations. Other combustible wastes, including PPE and plastic containment void of any hazardous constituents, will be managed as non-hazardous radioactive waste. All waste drums will also be analyzed by non-destructive assay to categorize them as LLW or TRU and they will be stored in an appropriate onsite storage area prior to offsite disposal.

The only liquids expected to be generated during Phase I or Phase II closure activities are the residual liquid holdup in the equipment. Liquid inventory in the tanks or ancillary equipment, except for incidental amounts that may be absorbed onto wipes, may be transferred directly into tank D-544, which is the temporary storage tanks for acids, or drained into 4-liter bottles. The bottles would be placed

into permitted or otherwise compliant storage areas and managed in accordance with applicable regulations. The contents of the bottles may be transferred to tank D-544 and the entire tank contents sampled and analyzed for RCRA characteristics prior to draining. Liquids in bottles destined for the Miscellaneous Cementation treatment process or the Caustic Waste Treatment process will be sampled and analyzed for final characterization prior to transfer.

Any mobile sludge found in components during closure activities will be removed or immobilized in situ prior to packaging for disposal, in accordance with applicable waste acceptance criteria. If process knowledge is not adequate, then sampling of the sludge will be necessary to characterize it properly. System components containing solidified sludge that adheres to the interior walls will be characterized using analytical results for a representative sample of the sludge, as determined by the Toxicity Characteristic Leaching Procedure, and managed in accordance with applicable regulations. The sampling protocol and number of sampling locations will be determined if solid residual material actually is encountered, and will be based on the Waste Characterization Plan.

8.0 SOIL CONTAMINATION EVALUATION AND POST CLOSURE CARE

The operating history for these tank systems (e.g., building logs, RCRA inspection logs and occurrence reports) indicates that there have been no spills or releases to the environment as a result of waste management activities in these units. Phase I and Phase II closure activities associated with these tank systems are not expected to impact the soils surrounding Building 771. Therefore, soil contamination will be evaluated as part of decommissioning and cleanup activities for the Building 771 complex under RFCA, and post-closure care activities are not necessary as part of the closure of these tank systems.

9.0 RECORDKEEPING

The following closure records will be maintained onsite during closure activities, and at a federal repository for a minimum of 30 years following the report of closure:

- sampling logs, including type, numbers and date of samples,
- analytical results,
- records of actions taken to decontaminate equipment and/or structures,
- work instructions used to conduct closure activities,
- closure report for Phase I activities, and

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- documentation verifying that closure activities were conducted in accordance with the approved Closure Plan and with this Closure Description Document, following completion of Phase II activities

10.0 AMENDMENT OF THE CLOSURE DESCRIPTION DOCUMENT

In conducting Phase I or Phase II closure activities, unexpected events that are identified during the implementation of closure activities may require an amendment to this Closure Description Document. Modifications to this Closure Description Document will be made in accordance with applicable regulations.

During the planning and development stage of Phase II closure activities, additional drawings that are developed for the removal of tanks and remaining ancillary equipment will be submitted as an addendum to this Closure Description Document. This Closure Description Document may be augmented or superseded by an approved Building 771 Decommissioning Operations Plan (DOP).

11.0 REFERENCES

- 1 Code of Colorado Regulations, Vol 6, No 1007-3, Part 265, Subpart G, Sections 265 110 through 265 120
- 2 Rocky Flats Environmental Technology Site RCRA Permit, Part X Closure Plan, effective 5/10/98
- 3 Rocky Flats Environmental Technology Site Closure Plan for Interim Status Units, effective 7/98
- 4 Rocky Flats Environmental Technology Site 1997 Hazardous Waste Tank Systems Management Plan, effective 2/13/98
- 5 Backlog Waste Reassessment Baseline Book, an RFETS Level 1 Manual, effective 2/17/98
- 6 Building 771 Basis for Operation (BFO), 98-RF-00947, effective 2/27/98
- 7 Building 771 Liquids Process Piping Removal Waste Characterization Plan, Rev 0, 12/3/98

Attachment 1: System Description and Boundaries for System #13

SYSTEM NUMBER	NAME	ENGINEER	REVISION DATE
13	LOW LEVEL DISSOLUTION (ASH, SS&C, ETC)	BOB McALLISTER	03/22/98

- A START POINT** Room 114, Line 3
Room 149, Lines 23, 24, and 25
- B END POINT** Ion Exchange Feed Tanks D-451 through 454 and 971/972 in Room 149
Recycle Tanks D-952-955 in Room 114
- C CHEMICAL COMPOSITION** 12N Nitric Acid (HNO_3)
Aluminum Nitrate [$\text{Al}(\text{NO}_3)_3$]
Calcium Fluoride (CaF_2)
- D RAD/ACTINIDE CONTAMINATION** < 6 g/l Pu
- E ESTIMATED SYSTEM MAX VOLUME** 5 Liters
- F TANKS INVOLVED** Tanks D-971 and 972 will have their fill line piping removed, with this removal will not isolating the tanks All tanks that accumulate liquids from Lo-Level Dissolution are captured in System 11 - Ion Exchange, or System 6 Evap/Batch/Precip
- G GLOVEBOXES INVOLVED** Room 114, Line 3
Room 149, Lines 23, 24, and 25
- H OTHER COMPONENTS** D-928 Potassium Hydroxide Caustic Scrubber, The scrubber and caustic drain piping from each of the dissolution gloveboxes will be drained and stripped out in System 26, Fume Scrubber

Line 3, Two sets of 3 dissolver pots, a slop pot, a condenser, and Vacuum Trap 3-2

Lines 23, 24, and 25, Each glovebox contains three dissolver pots, a condenser, two R-6 filters, at least one full-flo filter, and a slop pot

Vacuum Traps VT 23-1 and 25-1
- I SYSTEM INTERFACES** Room 149 Fume Scrubber
Process Cooling Water Supply & Return
Steam & Steam Condensate Return

Attachment 1, cont.: System Description and Boundaries for System #13

**J CHEMICAL
COMPATIBILITY AT
INTERFACE(S)**

CaF₂ was a dry compound added in small quantities to low level dissolution feed, acting as a catalyst during the dissolution process

Al(NO₃)₃ was metered into the number one dissolver pot to complex the fluoride ion during dissolution

Avoid mixing Nitric Acid with basic solutions, and Freon Nitric acid actinide solution has the potential to produce hydrogen gas

KOH was used to clean/flush condensers during Incinerator ash dissolution Incinerator ash dissolution was terminated in approximately 1980 The KOH piping in this system will be drained and removed as part of System 26, Fume Scrubber

**K NARRATIVE
DESCRIPTION**

Impure forms of plutonium were pulverized, bagged into the dissolution glovebox, mixed with 80g CaF₂ /kg PuO₂ and dissolved a series of three Airlift Dissolvers in HNO₃ at a temperature of approx 100°C

The undissolved solids were filtered through an R-6 filter, and a secondary Full-Flo filter, with the dissolved plutonium nitrate from Lines 23, 24, and 25 vacuum transferred to Ion Exchange feed tanks D-451 through 454 or D-971 and 972 (System 11) The dissolved plutonium nitrates from Line 3 were transferred to Tanks D-952 through 955 (System 6) The feed sources would then be collected, sampled, adjusted to the desired normality, and concentrated/purified as part of the Ion Exchange process

Vacuum Traps VT 3-2 and 23-1, and the process lines from the dissolution gloveboxes to their respective tanks were flushed and drained as part of the December 1989 Inventory

All of the piping in Line 3 with the exception of the Process Transfer Line to Tanks D-952 through 955 was removed in System 7, Hi-Level Dissolution

The Process Transfer Line exits Line 3 on the south end of the glovebox, near the 3-2 Vacuum Trap The piping travels north and then east, and ties into the Pu Nitrate Transfer Line at the north end of Line 7 The connection at Line 7 is welded

The Line 24 piping exits the backside of the glovebox, passes through the west cinderblock wall, and ties into the Line 23 piping The piping continues west, and attaches to the Tank D-971/972 fill line

Line 25 has two connections to Ion Exchange The piping comes out of Line 25, and tees to the north and south The north pipe turns back to the east above Line 23, and attaches to the D-971/972 PuNO₃ Transfer line, above the two tanks The south pipe turns east at the end of Line 25 and attaches to the D-451 through 454 fill line, above Tank D-454

Attachment 1, cont.: System Description and Boundaries for System #13

**L PIPING REMOVAL
DESCRIPTION**

Attaching a vacuum source at both ends of the piping transfer during removal is a good practice

Removal of pipe from the furthest point away from the vacuum source, working toward the vacuum source is a good practice

Line 3.

This piping will not be removed at this time The piping will remain in tact to support the draining of the remaining liquid systems in Building 771

Line 23 and 24:

Remove the piping from HV-702, 705 and 704 back to Line 23, and from Line 23 to Line 24

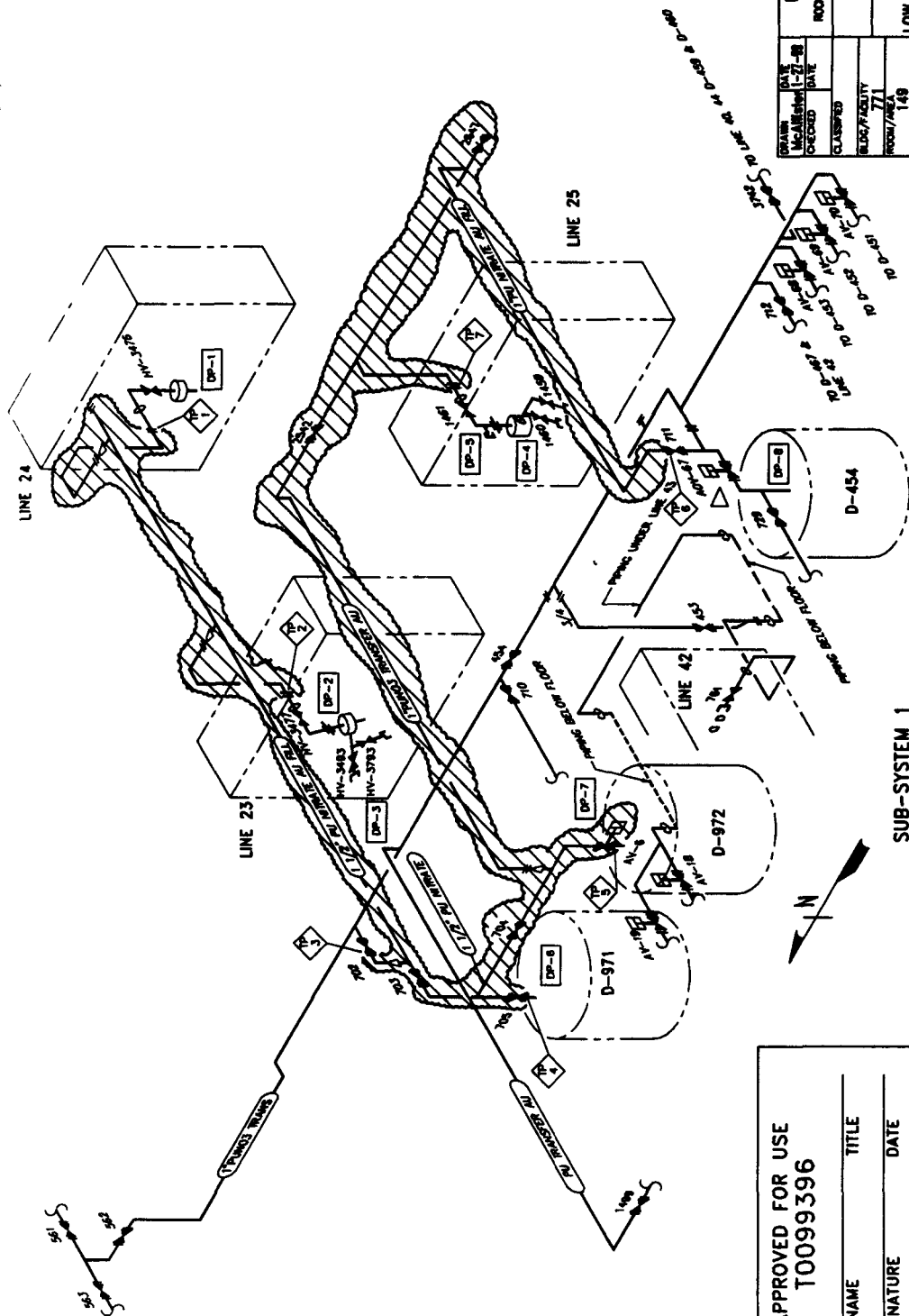
Line 25

Remove the piping from AV-6 to HV-2542

Remove the piping from HV-711 back to Line 25

Currently, Criticality Engineering will allow Tanks D-971, 972 and 454 to be placed on vacuum for piping removal

Figure 1 System #13 - Plutonium Nitrate Fill and Transfer Lines



APPROVED FOR USE T0099396	
NAME	TITLE
SIGNATURE	DATE

DESIGN	DATE	U.S. DEPARTMENT OF ENERGY
CHECKED	DATE	ROCKY FLATS AREA OFFICE
CHECKED	DATE	ROCKY FLATS PLANT
BLDG/FLY	7/11	ROCKY FLATS PLANT
ROOM/AREA	149	PROCESS PIPING REMOVAL
GRID COORDINATE	H-11	LOW LEVEL DISSOLUTION - SUBSYSTEM 1
SCALE	NONE	SHEET NUMBER
CAD FILE	LOW LEVEL DIS	B
SK-T0099396-X01		OF

20/20